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ABSTRACT

The interrelationship between general and special education and information science is discussed, and special education information systems are reviewed. Among information system developments described are ERIC (Educational Resources Information Center), the Council for Exceptional Children (including its data base, products and services), the Special Education Instructional Media and Materials Center Network, and the National Information Center for the Handicapped (commonly known as Closer Look). The author speculates on the state of the art in information and special education in the year 2000, and lists 12 guidelines for designers of information systems. (CL)

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Information and Special Education

Looking Forward to the Year 2000

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

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INFORMATION AND SPECIAL EDUCATION

LOOKING FORWARD TO THE YEAR 2000

Introduction

Information and special education, as visible and popular disciplines, are products of the 20th century. And for all practical purposes they are outgrowths of the second half of the 20th century! Of course, there are important and identifiable antecedents to both information science and programs for the handicapped prior to 1950, but the marriage of these two fields is a phenomenon of the 1960's. The development of this relationship in the last 15 years has been nothing short of spectacular. In fact, so much has taken place in the last decade alone that is presumptuous to "look forward to the year 2000" with the intention of predicting the state-of-the-art at that time.

To further complicate an already impossible task is the fact that this article will be read primarily by a non-US audience and I am not an international authority in either information or special education programs. I have difficulty keeping current with the developments in my own country. Thus, I must clarify a perspective for this article so as not to mislead the reader by the grandiose scope of the title. With the concurrence of the editor, I will describe information programs in the United States that have had and will continue to have an impact on the education of handicapped persons. Hopefully, the areas selected for description will be of interest and assistance to the reader.

I have stated that "information and special education" are phenomenon of very recent vintage. In support of that statement please consider this evidence. In March of 1968, the distinguished and internationally recognized special education authority, Dr. James J. Gallagher, made the following observation:

> "The job of all educators, including special educators, is to find the mechanisms through which we can translate new knowledge into action at the instructional level. Only in this way can we improve our services beyond a type of crafts or guild operation in which knowledge was passed on from master to apprentice in each generation.
> "Until very recently, we have depended upon a very simplified transmission of "knowledge into action" model in educational research and, to be blunt, it has proven to be a magnificent failure. This system provided financial support to the individual researcher who conducted his investigations and then reported his new discoveries in channels primarily designed to communicate with his professional colleagues rather than to the great mass of teachers and educators. (emphasis mine -- au.) The results of his research were then collected together, as best as possible, by college professors who presented them, in retranslated form, to embryonic teachers in the college classroom. These aspiring teachers were, in turn, expected to translate this information again to produce changed behavior in the classroom. Experience has taught us that we need a much more complex model for transmission of knowledge if we are to have any hope of producing the comprehensive educational changes that this generation desires and needs."
>
> Gallagher, J. J. Organization and special education. Exceptional Children, 1968, 34(No. 7), 485-486.

Dr. James W. Moss is generally regarded as the chief architect of the United States' Special Education Instructional Materials Center Network program which will be described later in this article. In November, 1969, in personal correspondence to the author, Dr. Moss stated:

> "Generally speaking, the various units making up knowledge producers and knowledge consumers exist in some form today. It is the communications network which does not exist in any meaningful form, although the Instructional Materials Center Network represents a beginning step in this direction. The various ERIC Clearinghouses also become pieces of this puzzle. The problem then becomes simple to state: What kind of a communication network or system must be developed to take knowledge from the producers and deliver it to the consumers? What changes must take place in both the development and delivery systems in order for this to work? What can be done to facilitate effective communication between relevant components of the system so that knowledge which needs to be shared actually is shared at a time when it is useful?

> "In conclusion, the science of communication is coming to education. It is already overdue. We have a period of time to plan for its orderly entrance and to facilitate its arrival. We have an opportunity to plan for tomorrow's education system and to make a system out of today's education."

In April 1970, the editors of the Journal of Educational Data Processing made the following comment in prefacing a special issue of their journal devoted to the Educational Resources Information Center (ERIC) program:

> "The concept of operating and managing a national, decentralized information system in the field of education is both new and unique. In many aspects of the Educational Resources Information Center (ERIC) program, its initiators have sought to capture that which has proven to be relevant to information handling in the sciences and other academic disciplines by adapting those conditions and circumstances to the many exceptional problems of the fields of education. The enthusiastic reception of these efforts, which in many cases are yet untried, has quickly reinforced the recognized need for the systematized dissemination of information on matters relating to the training of youth and adults.
>
> Journal of Educational Data Processing. Palo Alto CA: Educational Systems Corporation, 1970, 54.

Space was taken to include these quotations for two reasons: (1) The sources quoted are recognized within the United States as persons or agencies of stature who have a national perspective and therefore, speak with authority relative to the development of information programs in education; (2) The oldest of these three statements was made only 10 years ago! Thus, it is safe to conclude that the systematic development of comprehensive information programs in special education in the United States is still in its infancy. Based on personal contacts with European colleagues from several different countries, I believe it is safe to reach the same conclusion for the development of special education information programs in Europe.

While it is true that educational information system development is still in its infancy, I must state emphatically, as I did in the opening paragraph of this article, that some very extensive and effective programs have emerged in the past ten years. In fact, information initiatives in education have developed so rapidly that it is difficult to keep track of them and only a few of the major ones will be included in this article. Before I describe these systems, I must state two assumptions upon which the content of this article is based. These assumptions are not original with me nor are they new concepts to the education community. But they are absolutely essential cornerstones in my understanding and view of information and education--past, present, and future.

First, is my strong commitment to the fact that everything done in education must be directed toward the ultimate goal of enhancing the growth and development of the individual child. Too often it appears that we build new structures for the sake of having new structures; or develop new programs for the sake of having new programs; or employ new technology for the sake of using new technology. Too often, the child seems to get lost in the shuffle because we are too busy concentrating on the technical perfection of our new development.

Second, is my equally strong belief in the absolute centrality of a creative, committed, and competent teacher to nurture the growth and development of the individual child. Long before the development of film, recorders, computers and information systems there were teachers who did an outstanding job in guiding the educational development of children. There is no question that their efforts can be enhanced by modern developments. But it is equally true that they operated quite effectively without them. The reverse cannot be true. No amount of systems

development will preclude the presence of the teacher. Perhaps this is an unnecessary reminder. However, the remainder of this article deals with macro-systems and I believe that it is important to keep in mind that systems are a means to an end and not an end in themselves.

Major Information System Developments in General Education

The title suggests that this article is about "Information and Special Education." However, from both an historical viewpoint and from a futures perspective, it would be a gross oversight not to give brief attention to information initiatives in general education that have both direct and indirect impact on special education.

The first broad-scale educational development occurred in 1966 with the creation of the Educational Resources Information Center (ERIC) program. The purpose of ERIC is "to provide a comprehensive and systematic linkage between producers and users of research results and information about tested educational improvements."

> Burchinal, L. G. The educational resources information center: An emergent national system. Journal of Educational Data Processing, 1970, 56.

Three primary objectives have guided the ERIC program in the 12 years of its existence.

1. To guarantee ready access to the world's English language literature relevant to education.
2. To generate new information products by reviewing, summarizing, and interpreting current information on priority topics.
3. To infuse information about educational developments, research findings, and outcomes of exemplary programs into educational planning and operations.

A discussion of the complex organizational structure of the ERIC system is probably not relevant to this article except to point out that it operates as a cooperative and successful collaboration between the United States federal government, a number of contractors from the non-profit professional sector, and several contractors from the commercial or for-profit sector. "Users" of the ERIC system include individuals, information and media centers, libraries, professional associations, school districts, colleges and universities, research/development/demonstration centers, local, regional, state and federal governmental agencies. This collaborative mixture certainly has implications for the future of world wide information programs.

The major products of the ERIC system are well known on the international scene. Resources in Education (RIE) published monthly, includes bibliographic and summary information on non-periodical literature covering all aspects of education. Each issue of RIE contains approximately 1400 different citations. The complete, historical RIE data base now includes over 125,000 document descriptions. A companion product to RIE is Current Index to Journals in Education (CIJE). The contents of 750 educational journals are cited with annotations in this monthly publication. Over 150,000 different educational articles have been referenced in CIJE since it began in 1969. The entire ERIC data base (RIE and CIJE) is available in machine readable format and several companies provide on-line searching of the ERIC file both in the United States and in other countries. Many of the complete documents cited in the ERIC abstract publications are available in microfiche form and are marketed internationally. Since 1967 the various ERIC components have developed, produced and distributed over 2500 individual new publications covering all aspects of education.

The ERIC program has been a remarkable success. But it has not been without its critics who have correctly identified major problems. For example, it has been said that: "ERIC is too remote from the ultimate user, the teacher"; "ERIC is too limited in the areas it covers"; "ERIC does not address enough of the day-to-day instructional problems that occur in the classroom"; and "ERIC does not adequately translate research findings into usable practice". Those who have been involved in the ERIC system for some time do not see these criticisms as a threat but rather a healthy sign of an educational community increasingly aware of the value of information and voracious in its appetite for data that is relevant and applicable to every conceivable type of educational situation. Analysis of critic's comments related to areas where ERIC was not delivering needed services lead to the creation of new components to carry on specific functions within the total information transfer process. During the past 5-7 years there has been an energetic development of information system components at both state and sub-state levels. Local school districts, individually or in cooperation with other school districts, have established information/resource centers to provide educational practitioners with a wide array of assistance mechanisms designed to help them improve educational practice. Components have emerged specializing in other information functions such as the "translation" of research into practice, or the demonstration of new exemplary educational practices. Training programs are following suit by changing their courses of study to produce a new breed of professional -- the educational information consultant.

As is true with any new, rapidly growing field of endeavor there are instances of lack of coordination between agencies and projects, duplication of effort, and even rivalries over distribution of responsibilities. A first major step toward coordination of all information dissemination programs in the United States was taken in June, 1977.

A National Dissemination Forum was sponsored by the U. S. Department of Health, Education, and Welfare. Attendees included representatives of many of the educational information programs in the United States. The primary purpose of the Forum was to initiate procedures which would ultimately lead to the development of a comprehensive educational information system in the United States for maintaining and improving educational practice so that all citizens may have the opportunity to learn in accordance with their need. A "Statement of Principles" was developed and adopted by that group which, although it does not have the force of policy, will provide a framework for broad scale development and implementation of educational dissemination activities for some time to come.

Major Information System Developments in Special Education

As stated at the beginning of this article, special education programs for handicapped children and youth in the public schools is a 20th century development. The first half of this century witnessed the development of a number of outstanding programs for all types of handicapped persons. Yet, as recently as 1965, it was estimated that only 38% of the United States' handicapped school aged population was receiving any type of appropriate special educational services.

The Council for Exceptional Children

Concern for the education and training of all exceptional children led to the establishment of the International Council for the Education of Exceptional Children in 1922. One of the primary motivating factors spawning this organization was the need for communication between persons pioneering new educational territory who were isolated from each other and largely ignored by the educational mainstream.

Information was a chief cornerstone in the early beginnings of this unique professional association, now known internationally as CEC -- the Council for Exceptional Children. For the first forty years of its existence, CEC's information program consisted almost exclusively of a professional journal (Exceptional Children), professional meetings which permitted face to face sharing of information, and the publication of an occasional book or monograph. But CEC was very much in the vanguard of new developments taking place in education in the middle 1960's. Using a combination of its own initiatives and some funding made available through contracts with the U. S. federal government, the organization developed what is now known as the CEC Center on Information, Technical Assistance and Training. The entire focus of this Center is to identify, package, and disseminate the best available information to persons who are working with or on behalf of exceptional children and youth. Space does not permit a discussion of all parts of this information program, but one component deserves further elaboration.

The CEC/ERIC Clearinghouse on Handicapped and Gifted Children

CEC has operated the ERIC Clearinghouse on Handicapped and Gifted Children since the ERIC program was begun in 1966. Using its affiliation with the ERIC program as a starting point and supplementing this support with other resources, CEC has established a data base known as Exceptional Child Education Resources (ECER). Since ECER is totally unique and will undoubtable play an important role in the development of future information services, it is described in detail.

ECER Data Base - ECER is a special interest, 25,000 item data base developed and maintained by CEC. Its content focuses exclusively and comprehensively on the English language professional literature related to the education of all exceptional children --

handicapped and gifted. The policy which guides the selection of new additions to the ECER data base is as follows: "It is the policy of CEC Information Services to acquire selected professional materials that relate to or are concerned with the education of handicapped and gifted children and youth. For further clarification the terms in this policy state are expanded and explained:

- acquire selected. . . CEC locates, obtains, and examines literature on the education of handicapped and gifted children and youth. All documents/articles received are reviewed and screened before their selection for entry into the data base since they must satisfy the requirements specified in this acquisitions policy statement.
- professional materials. . . Items selected may be of a print or non-print nature including books, monographs, research reports, literature guides, curriculum guides, program descriptions, journal articles, pamphlets, newsletters, films, cassettes, filmloops, filmstrips, videotapes, and other related materials. Instructional materials for use by children are NOT included.
- that relate to or are concerned with. . . Items are considered for review if their content has implications for the education of handicapped and gifted children and youth. The item may be pertinent to: (a) other professions such as medicine, law, architecture, psychology, and social work; (b) other

educational mission areas such as early childhood, disadvantaged children, vocational and career education, physical education, and recreation; and (c) other curricular areas such as reading, mathematics, social studies, and science.

- education and training. . . Activities in the Information Center focus on the education of handicapped and gifted children. Acquisitions sought concern theory, research, programs, practice, and teacher education related to this focus. Acquisitions should deal with topics such as instruction, counseling and guidance, administration of programs and services, preparation of professional and para-professional personnel (preservice and inservice), support services, institutional placement and deinstitutionalization, federal and state law, policy and the legislative process, litigation, incidence and statistical information, professional organizations, and information for parents which will be beneficial in the educational planning for and placement of their handicapped and gifted children and youth. The acquisitions program also covers the literature on child abuse and neglect.
- handicapped and gifted children and youth. . .Handicapped and gifted (exceptional) children and youth are those individuals (a) who deviate from the normal in cognitive, sensory, affective, physical, and behavioral domains, or (b) who require a program of special education services including instructional materials, special teaching methodology, specially trained personnel in

a day school program (special class, resource room, counseling teacher program, regular class placement, diagnosis and treatment center), special school, residential or private school, hospital, or home instruction setting.

ECER Products and Services - A data base is a monument to futility unless it is easily accessible to all of its potential users. CEC has avoided the construction of such a monument by developing these access tools for its data base:

- exceptional child education resources. . . Exceptional Child Education Resources (formerly known as Exceptional Child Education Abstracts, ECEA) is the print presentation of the ECER data base. ECER, a quarterly publication in its ninth volume year, contains all citations entered in the data base. Every citation, including journal articles, give author, title, source, publication date, availability and/or ordering data, descriptors, and an abstract or descriptive summary of the document or article. Each issue of ECER has a subject, author, and title index for that issue. The fourth issue of each volume year contains a cumulative index for the entire volume year. Beginning with Volume 9, No. 1 (Spring 1977), two new sections were added to ECER. One section lists recently completed doctoral dissertations in special education. The second section contains a listing of non-print resources that are directly applicable to the training of special education personnel.

- custom computer searches. . . CEC maintains the capability to do on-line interactive computer searching of the entire ECER data base. Of all the data base access tools employed, the computer search permits the quickest, most accurate and up-to-date location of data. The searching package used allows full text searching of all relevant fields including the abstract. The computer file is updated with new citations eight times a year and consequently is always more current than any other resource. To ensure the most efficient use of this powerful tool, CEC employs highly trained information specialists to analyze a user's request for information and select the most appropriate searching strategy for locating the desired information.
- topical bibilographies. . . There are times when the most up-to-the-minute information is not essential but a good overview of a subject area is important. In these cases a topical bibliography will often meet the need quite nicely. To meet this need CEC has developed a series of 66 different bibliography titles, each one of which addresses a specific area of concern. Each bibliography contains the most relevant citations on the topic area. They are drawn directly from the ECER data base. The printed bibliography citations include author, title, publication date, source, availability, descriptors, and an abstract or descriptive summary. Most

bibliographies are updated on an annual basis. New titles are added to the series as needed and unused ones are dropped. Sample titles from the current (1976) bibliography series include:

Attitudes toward the Handicapped

Child Abuse

Mainstreaming -- General

Early Childhood Identification

Learning Disabilities -- Secondary Level

Gifted -- Teaching Methods/Curriculum/Teacher Training

- selective dissemination of information (SDI). . . The SDI is a relatively new addition to the information services provided by CEC. Its purpose is to automatically and regularly provide current awareness of all literature acquired in specific topic areas on a subscription basis. An SDI subscriber receives eight computer print-outs a year. Each print-out contains citations (title, author, publication date and source, availability data, descriptors, and a 200 word abstract) of every item acquired in the subject area since the last print-out. Twenty-one different topic areas have been selected by CEC and are available on an SDI basis.
- use of resource library. . . CEC maintains a noncirculating resource library at its headquarters in Reston, Virginia. This library contains the "hard copy" of every document

entered in the ECER data base as well as current issues of periodicals that are scanned for appropriate articles to be included in the data base. All journal articles cited in the ECER data base and the entire ERIC data base are available in microfiche. All standard library reference tools are also available. The public is encouraged to use this resource.

Other CEC Information Activities

It would be inappropriate to leave the reader with the impression that the ECER data base with its products and services was the total or even the major component of CEC's information program. This might prevent the reader from ever discovering that CEC is a major publisher of books covering all aspects of educating handicapped and gifted children; or that it operates a policy research center; or that it conducts extensive activities in the area of inservice education; or that it provides technical assistance in the areas of policy or program development; or that it produces periodicals dealing with research, programs, policy, funding, curricula, litigation, emerging issues, international cooperation, and many more. Extensive articles could be written on all of these topics. The more important fact that needs to be stressed in relation to the subject of this article is that CEC, as an organization, is an information/communication system in itself. CEC has a membership of over 65,000 persons who are in one way or another involved in the education of all handicapped and gifted children. This membership consists of teachers, administrators, teacher educators, students-in-training, researchers,

paraprofessional workers, parents, and representatives from all of the allied disciplines such as doctors, psychologists, child development specialists, social workers and many more. There are CEC members throughout the United States and Canada organized by State or Provincial Federations into almost 1,000 local chapters. Though specific interests of individual members or even of local geographic areas may vary, there is a central purpose which gives overall direction to the entire organization -- that of improving educational services for all handicapped and gifted children, and to provide them with an equal opportunity to receive an appropriate education. The interests and needs of this extremely diverse group of 65,000 is a driving force behind the success of the organization. There is an organizational commitment toward information sharing and communication, toward reduction of barriers that inhibit growth of programs for the handicapped and gifted, and toward implementation of new ideas and concepts that have proven to be effective in working with handicapped and gifted children.

As striking proof of the effectiveness of CEC's commitment toward bringing about change on behalf of exceptional children through trans-geopolitical cooperation, I offer the following example because I believe it has far reaching implications for international efforts on behalf of the exceptional during the remainder of this century. Through years of careful labor, in which CEC members from all over the U.S. participated, CEC was the prime moving force that resulted in the passage of a Federal law known as the Education of All Handicapped Children Act of 1975.

This law, whose implementation began in the Fall of 1977, requires that every state and territory in the United States of America provide a free, appropriate public education to every one of its handicapped children. The legislation provides a measure of fiscal support to accomplish this objective and it also suggests serious penalties for states that do not comply. This legislation, and the activities that it requires, will be the single most important ingredient allowing the U. S. to enter the 21st century with a sense of adequacy for its handicapped population.

Special Education Media Information Services

Predating the appearance of ERIC by two years was a special education media and materials information program that has had a profound influence in the United States over the past 14 years. This program has had several different names and has gone through some very significant reorganizations during its lifetime. But its influence is still strong. From 1964 to 1974 this program was known as the Special Education Instructional Media and Materials Center Network. The purpose of the program was stated in this way: "To provide special educators and related personnel with ready access to valid materials and information related to the education of handicapped children." The uniqueness of this project was in the establishment of regional centers and in the concept of a national network of diverse but cooperating units. "Each unit (1) examined the various educational needs of handicapped children; (2) employed effective modern methods, media, and materials to meet these needs through consultation services, conferences, inservice training meetings, the development and loan of media and materials,

and mobile library units; and (3) disseminated its findings throughout the Network." The success of this program was so great that it put itself out of business. This "Network" of less than 20 regional centers in the U. S. began as a direct-service-to-the-user program. In a short period of time their services were in such demand that they could not begin to fulfill the requests for their services. It was a case where a program's vision far exceeded its ability to deliver. But again, the result was not retrenchment. Rather, it forced the program developers back to their drawing boards to do a careful analysis of the needs that had become evident, and to create a number of different types of units that performed much more specific roles. The most permanent and significant outgrowth of the program was the emergence of the local media/materials center or, as they have come to be known, the instructional resource center. These centers are local in the sense that they serve a very limited geographical area so that instructional personnel can easily come to the center to examine instructional materials and to receive assistance from a trained consultant. A second very important outgrowth was the increased commitment to and involvement in media and materials information by the various state education agencies. In many cases these agencies began to assume a number of the functions previously performed by the regional centers. As local and state education agencies became more involved in these services, new roles were assumed by the regional federal projects. In 1974, Special Education Instructional Media and Materials Centers became the Area Learning Resource Centers (ALRC's) and operated until Fall, 1977 with the following purposes:

1. To assist states in stimulating and developing local level, intermediate level, and state level material center services.

2. To provide technical assistance to state education agencies in the states' planning of materials services.

3. To consult with state and local agencies on the utilization of special education materials and educational technology.

4. To assist in the conduct of media and materials conferences and workshops.

5. To promote the training of teachers in the selection and utilization of special education instructional materials.

6. To facilitate the dissemination of information about child-use instructional materials to recipients designated by the state education agencies.

7. To provide human resources to reinforce the states' staff in the media, materials, and educational technology area.

8. To act as a linking agent between the needs for materials information and materials loan and the resources designed to meet such needs.

Another major component in this system emerged during the 1972-77 period. It was known as the National Center on Educational Media and Materials for the Handicapped and was established to facilitate the use of new educational technology in instructional programs for handicapped persons. Its major purposes were:

1. To assist in the identification of needs for child-use materials.

2. To assist in arranging for commercial or noncommercial distribution of newly developed child-use and teacher training materials.

3. To develop and operate a computer-based National Instructional Materials Information System (NIMIS).

The work performed to date on Purpose #3 is a significant forward step in the overall landscape of special education information programs and is destined to have a profound impact on instruction of handicapped children. A computerized bibliographic information retrieval system for instructional materials in special education is operational and can be accessed via remote terminals from all over the United States. The major categories materials described in this data base include child-use instructional materials (print, film, audio, realia, etc.); appraisal instruments;

teaching strategies; and print and nonprint materials which might be used to increase teacher and parent competencies in the selection and usage of child-use instructional materials, appraisal instruments, and teaching strategies.

The primary audience for whom this information resource was designed are those persons who are directly involved in planning and/or implementing instructional programs for individual handicapped children. The Education for all Handicapped Children Act, referred to earlier, requires that an individualized educational program be designed for every handicapped child. As NIMIS develops its capabilities, it will become a critical resource for matching media/materials with children's individual learning requirements. A teacher will be able to submit a question such as "What films are available to teach computation skills to learning disabled children who are functioning at the third grade level?" and NIMIS will provide a list (with descriptions) of available materials.

National Information Center for the Handicapped

There are a number of nationwide programs that could appropriately be included in a comprehensive study of special education information activities in the U. S. But for the most part they are more limited in scope than those that have been described in this paper. For example, there are information "Networks" for handicapped child early education projects; for persons engaged in the location, identification and assessment of severely handicapped children; and for persons who specialize in the education of hearing and vision impaired children. The list would grow tremendously if the information activities of all specialized professional and parent associations were added.

There is however, one more information program that needs to be given recognition in this paper. That is the National Information Center for the Handicapped, or, as it is more commonly known, Closer Look. Closer Look was originally established to help parents of handicapped children and youth by offering practical advice and assistance in finding educational programs and other kinds of special services. Closer Look provides information on resources for all types of handicapping conditions and their services are now used not only by parents of handicapped children but by handicapped youth and adults themselves. Students in training also find information from Closer Look to be useful as do teachers, psychologists, social workers, and other professionals in their search for resources in their communities. Since this program is completely funded by the federal government, Closer Look services are available free of charge to anyone in the United States.

Information, Special Education, and the Year 2000

What will be the state-of-the-art in information and special education in the year 2000?

Because I am not a clairvoyant I have had a great deal of difficulty in preparing this section of the article. And because I am a great believer in the creative ability of the human being, I know that things will be taking place 22 years from now about which I cannot even begin to speculate. As I have wrestled with these imponderables I remembered an ancient fable. In a remote and primitive village there lived a very wise man whose counsel was sought by the people and who seemed to consistently render omniscient answers. One day a young rebel came to the sage with a scheme designed to prove the old man's fallibility. In his cupped hands the young man held a small bird and posed the question, "Old man, is the bird in my hands dead or alive?"

He reasoned that if the old man said the bird was alive he would crush it; and if the old man said the bird was dead he would release it and let it fly away. "Well, what is the answer to my question?" urged the young man. After a moment of reflection the old man said "It shall be as you choose!"

Information and Special Education in the Year 2000 will be exactly what we choose to make it.

If we so choose it will be no different than it is today. Or perhaps even worse. This situation will prevail if each community, each state, each region, each nation insists on protecting its own "territory" and refuses to admit that it either has something to share with or learn from its neighbor. In this case, we will build yet another monument to non-information which I call ignorance.

If we so choose we can launch numerous man-made celestial satellites that are linked to giant computers and are capable of transmitting hundreds of thousands of bits of information to remote stations where terminals can send to anywhere and receive from anywhere, data, voice and facsimile messages. In this case we can build yet another monument to technological sophistication.

If we so choose we can reduce the entire world's knowledge about everything to a shoe box filled with ultrafiche. In this case we can build a miniature monument!

Or we can choose to step back and examine what has been learned about information and special education in the last 10-15 years, whatever its source, and apply it carefully and systematically to the problems and promises of educating individual handicapped persons. New initiatives may or may not include ideas from another community or another international "power-bloc"; they may or may not use the latest technological innovations; they may or may not include miniaturization or any other "thing" that could be cited as a possible development by 2000.

So, after committing all these words to print and leading the reader through page after page in search of the information system of the 21st century, I will admit that I cannot describe THE future information system for special education. However, I would like to conclude this article with a set of Guidelines that have been articulated by two well-known information scientists. The authors call them "Guidelines for the Designers of Information Systems" and they are derived from an exhaustive review of literature on information and information needs. These 12 statements strongly reinforce and clearly state my feelings that have emerged from 10 years of experience and hopefully they succinctly express some salient implications of the material presented in this paper. I strongly recommend their careful application to all persons who aspire to design information systems of the future for special education.

GUIDELINE I. Identify the specific information the user actually needs or requires for what he is doing.

GUIDELINE II. Identify the user in relation to his discipline or environment.

GUIDELINE III. There must be interaction between the information broker and the user whether he is a part of the research community or the general public.

GUIDELINE IV. Information should be provided in a form suitable to its effective use.

GUIDELINE V. Existing records should be broad enough in scope to provide required information and to allow for accidental discovery.

GUIDELINE VI. The system should be so designed as to provide the right amount of information at the right time.

GUIDELINE VII. Information should be stored in such a way that it is not only available but easily accessible.

GUIDELINE VIII. Standards must be developed to insure the utility of future data collections.

GUIDELINE IX. The system should assume that the user has not articulated his information need.

GUIDELINE X. The system should adapt itself to the receiver's associative habits and not insist on the converse.

GUIDELINE XI. Since oral communication is an important feature of gathering information, the system should devise ways for facilitating the dissemination of such information.

GUIDELINE XII. Availability of information can be more important than specific information requirements.

Fabisoff, S. G., & Ely, D. P. Information and information needs. Information Reports and Bibliographies, 1976, 5(No. 5), 11-15.

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